Remarks/Arguments

35 U.S.C. §103

Claims 1-3 & 6-7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Razavi et al. (US 6,807,406), hereinafter Razavi.

Claims 4-5 & 8-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Razavi in view of Tsukuda (US 6,282,414).

The present invention, as recited in currently amended claim 1, describes an RF-circuit including a controllable mixer having at least one mixing transistor, to which mixing transistor an oscillator signal and an input signal are supplied, wherein the input signal comprises a useful signal and further signals, and wherein an output signal is produced as an output of the mixer, wherein a controller is provided, which applies a control signal to the-mixing transistor as a function of the signal quality of the demodulated output signal, wherein the operating point of the at least one mixing transistor can be set by means of the control signal, in which case the intermodulation immunity and/or the noise in the output signal can be varied as a function of the operating point of the at least one transistor, wherein a controllable portion of the overall gain of the RF-circuit is determined by the operating point of the at least one mixing transistor.

It is respectfully asserted that Razavi fails to disclose an RF-circuit "wherein a controller is provided, which applies a control signal to the mixing transistor as a function of the signal quality of the demodulated output signal, wherein the operating point of the at least one mixing transistor can be set by means of the control signal," as recited in presently amended claim 1.

Razavi describes a system where "a receiver system is provided with a variable gain mixer circuit that is advantageous over current architectures used in wireless communication systems. The use of a variable gain mixer circuit simplifies the receiver architecture resulting in the elimination of additional circuit blocks and a reduction in complexity and cost. Moreover, one embodiment of the present invention includes a mixer

circuit comprising a mixer core, a bias circuit coupled to the mixer core for providing a bias current, and a variable impedance network. The mixer core receives input signals and generates output currents that are coupled to the variable impedance network. Each of the output currents are selectively coupled to a voltage output node through a variable impedance. Variable gain is established by varying the impedance between the output currents of the mixer core and the voltage output node." (Razavi Abstract)

The Office Action asserts that "Razavi teaches an RF circuit and method for including a controllable mixer having at least one transistor to which an oscillator signal and an input signal are supplied with the input signal and with an output signal being produced as an output of the mixer (Column 5, Lines 14-19; Razavi) wherein a controller is provided which applies a control signal to the mixer as a function of the signal quality of the output signal (Column 5, Lines 38-41; Razavi) wherein the operating point of the at least one transistor can be set by means of the control signal (Column 7, Lines 20-39; Razavi) in which case the intermodulation immunity and/or the noise in the output signal can be varied as a function of the operating point of the at least one transistor (Column 7, Lines 20-39; Razavi) wherein a controllable portion of the overall gain of the RF circuit is determined by the operating point of the at least one transistor of the mixer (Column 4, Lines 48-51; Razavi)." (Office Action, pages 2-3)

The Office Action admits that Razavi fails to teach that the RF signal comprises a useful signal and further signals.

Applicant respectfully disagrees with Examiner's assertion that Razavi teaches an RF-circuit "wherein a controller is provided, which applies a control signal to the mixing transistor as a function of the signal quality of the demodulated output signal, wherein the operating point of the at least one mixing transistor can be set by means of the control signal," as recited in presently amended claim 1.

Razavi et al. (US 6,807,406) disclose a variable gain mixer circuit for a radio receiver, which comprises a DSP that decodes data and provides the decoded data at a first output. The DSP further has a second output for adjusting the gain of the mixer. The gain is

adjusted in response to a comparison of the amplitude of the signal at the output of an AD-converter with respect to the maximum output of the AD-converter in order to optimise the use of the dynamic range of the AD-converter (column 2, lines 21 to 22; column 5, lines 41 to 43).

For adjusting the gain, Razavi et al. disclose scaling the signal at the output of the mixer (see figure 4; see column 6, lines 19 to 29). To this end, Razavi et al. disclose coupling the outputs to the input of a variable impedance network. In column 6, lines 23 to 29 Razavi et al. disclose that: "Variable conversion gain may be achieved by selectively coupling the output currents to the voltage output nodes through a variable impedance. The variable impedance may be a digitally controlled resistor network with the output current selectively coupled to various internal network nodes to produce the desired output voltage..." In other words, the operating point of the transistor that is actually performing the mixing of the two input signals is not changed. Rather, the output signal, in this case an output current, is applied to a switchable current-to-voltage conversion stage that scales the output signal to obtain a desired output voltage.

Razavi et al. fail to disclose adjusting the operating point of a mixer transistor in response to a signal indicative of the quality of the demodulated signal. Instead, the passage from Razavi cited with regard to the claim element "a controller is provided which applies a control signal to the mixer as a function of the signal quality of the output signal," Column 5, Lines 38-41; Razavi, states, "For the embodiment shown in FIG. 3, gain control of the variable gain mixer circuit is illustrated by including a DSP 160 that provides a second output on bus 40 Dgain 195."

The passage from Razavi cited with regard to the claim element "wherein the operating point of the at least one transistor can be set by means of the control signal," Column 7, Lines 20-39; Razavi, states in part, "In response to a digital control signal from digital controller 530, variable impedance networks 510 and 520 selectively couple each of the corresponding differential output currents to a plurality of network nodes inside each variable impedance network." Applicant is unable to find in column 7, lines 20 to 39 of Razavi et al., any indication of adjusting the operating point of a transistor, as described in

the present claim 1. Further, Razavi et al. do not mention varying intermodulation immunity and/or noise in the output signal as a function of the operating point of the at least one mixing transistor in column 7, lines 20 to 39. Rather, Razavi et al. mention optimally using an AD-converter's range (column 5, lines 41 to 43) in order to reduce the quantization error, which is becoming more dominant when an AD-converter output range is not optimally used (column 2, lines 37 to 44).

Razavi et al. do not even consider adjusting the operating point of the mixer transistor. Rather, Razavi et al. used a fixed operating point (implicit, in fact Razavi et al. do not even mention adjusting the operating point at all) and scale the output signal to a desired value in a resistor network.

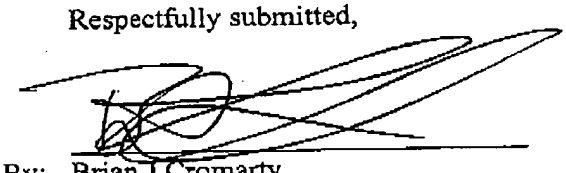
Therefore, Razavi et al. fail to teach essential elements of the invention as claimed in claims 1 and 6, and use a completely different approach for adjusting the gain in the variable gain mixer circuit. Specifically, Razavi fails to disclose at least an RF-circuit "wherein a controller is provided, which applies a control signal to the mixing transistor as a function of the signal quality of the demodulated output signal, wherein the operating point of the at least one mixing transistor can be set by means of the control signal," as described in claim 1. Additionally, as admitted in the Office Action, Razavi fails to teach that the RF signal comprises a useful signal and further signals. The invention as claimed in currently amended claims 1 and 6 is, therefore, not obvious over Razavi et al. and the knowledge of the person of ordinary skill in the art.

In view of the above remarks and amendments to the claims, it is respectfully submitted that there is no 35 USC 112 enabling disclosure provided by Razavi that makes the present invention as claimed in claim 1 unpatentable. It is further submitted that currently amended independent claim 6 is allowable for the same reasons that claim 1 is allowable. Since dependent claims 2-5 and 7-9 are dependent from allowable independent claims, respectively, it is submitted that they too are allowable for at least the same reasons that their respective independent claims are allowable. Thus, it is further respectfully submitted that this rejection has been satisfied and withdrawn.

Having fully addressed the Examiner's rejections it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's representative at (609) 734-6804, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No fee is believed due. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,



By: Brian J Cromarty
Reg. No. L0027
Phone (609) 734-6804

Patent Operations
Thomson Licensing Inc.
P.O. Box 5312
Princeton, New Jersey 08543-5312
April 21, 2008